

Agenda Item: 8.

Memo to the Programs, Projects and Operations Subcommittee

Subject: Elkhorn River IPA – Bank Stabilization Construction Project Change Orders

Date: July 9, 2012

From: Gerry Bowen

In December, 2011, the Board approved a project to repair bank stabilization measures on the Elkhorn River Improvement Project Area due to damages from the 2010 flood on the Elkhorn River. The contract was awarded to Ho Chunk Builders (South Sioux City, Nebraska) in the amount of \$1,020,995.

In February, 2012, Management approved Change Order #1 in the amount of \$31,449 for the installation of a temporary crossing of a drainage ditch to facilitate transport of the rock rip rap on the west side of the project.

In May, 2012, Management approved Change Order #2 in the amount of \$56,550 for the installation of additional streambank protection on the Scott Watson property. The total amount of these two change orders is \$87,999. The District's Policy Manual allows Management to approve change orders amounting to 10% of the contract amount, or approximately \$102,000. With these two change orders, the contract with Ho Chunk had a not to exceed amount of \$1,108,994.

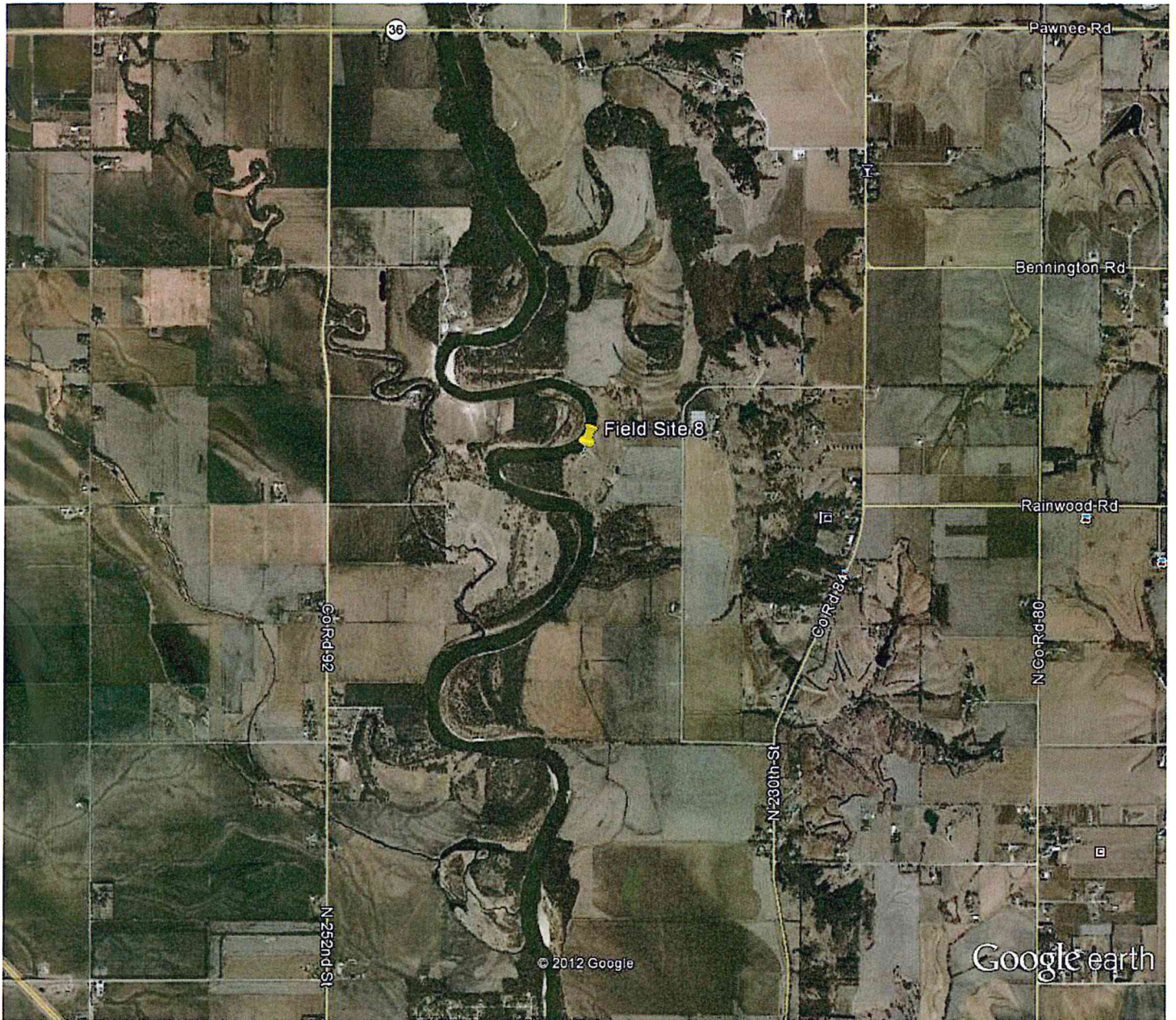
The majority of the project involved the placement of riprap above the normal high water level, thus negating the need for a 404 permit from the Corps of Engineers. Two Nationwide Permits were necessary (Field Site 2 for riprap placement below the normal high water level, but not of sufficient length to warrant an individual permit, and the relocation of the boat ramp at Elkhorn Crossing Recreation Area and were obtained allowing construction to occur.

A third site, Field Site 8 was thought to need an individual permit since rather elaborate bank stabilization measures were needed. In order to not delay the remainder of the project, Site 8 was not included in the bid documents. It was intended that the 404 permit application would be submitted and the project bid at a later date.

In May, the Corps issued a general permit that would cover the work needed at Site 8. Therefore, Ho Chunk was asked to submit a proposal for treatment of the site. Also, it was determined that some additional work was needed at Elkhorn Crossing Recreation Area. Ho Chunk's estimate for the additional work at Elkhorn Crossing is \$4,305.00. Ho Chunk's estimate for the bank stabilization work at Site 8 is estimated to cost \$204,991.25, for a total amount of this change order of \$209,296.35, increasing the not-to-exceed amount of the contract with Ho Chunk Builders to \$1,318,290.40. Board approval of these change orders is necessary.

Since all of the work envisioned in this change order was a portion of the original project damaged by the 2010 flood, the additional work is eligible for 75% FEMA cost share, or \$156,972.26 ($\$209,296.35 \times 0.75$) making the NRD share of this treatment \$52,324.09.

- **It is recommended that the Subcommittee recommend to the Board that the General Manager be authorized to execute Change Order #3 in the amount of \$209,296.35, and increasing the not-to-exceed amount of the contract with Ho Chunk Builders for the Elkhorn River IPA Bank Stabilization Project to \$1,318,290.40.**



Google earth





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Gerry Bowen
Papio-Missouri River NRD
8901 S. 154th Street, Suite A
Omaha, NE 68138

Re: Elkhorn River IPA Bank Stabilization Change Order 3 Recommendation

Dear Gerry:

Tetra Tech recommends that the work included in Change Order 3 for the project referenced above should be completed. The items at the Elkhorn Crossing Recreation Site were discussed with P-MRNRD Board and staff after construction of the boat ramp was complete and were determined to be necessary in order to reopen the recreation site.

Bank stabilization for Field Site 8 (FS8) was originally identified in Tetra Tech's Preliminary Observations and Recommendations for Repairs to Elkhorn River IPA Technical Memo completed for the P-MRNRD on January 10, 2011. However, this site was not included in the construction bid for the remaining IPA sites because it was believed to require a 404 Individual Permit from the United States Army Corps of Engineers (USACE). It was recently learned that the USACE adopted General Permit 11-02 that covers restoration of sites damaged by flooding.

FS8 qualifies for this permit, therefore an Individual Permit is no longer required. Tetra Tech has completed the design and is in the process of fulfilling the application requirements for the General Permit, which are much less extensive than an Individual Permit. The construction of FS8 is recommended to be added to HO Chunk's current contract to be constructed once the permit is obtained.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mike Sotak'.

Michael K. Sotak, P.E.



Change Order

Date:	27 June 2012
Project:	P-MRNRD Elkhorn River IPA Bank Stabilization
Tt Project Number:	100-SWW-T27355
Change Order Number:	3

Original Value of Contract: \$ 1,020,995.30

Change Orders to Date: \$ 87,998.75 (See below)

Net Change this Change Order: \$ 209,296.35 (See next page)

Resulting Contract Value: \$ 1,318,290.40

Previous Change Orders:

1. \$31,448.75
2. \$56,550.00
3. _____
4. _____
5. _____

Approved by:



(Resident Project Representative)



(Project Manager/Office Lead)

Brian Armbrust

Digitally signed by Brian Armbrust
DN: cn=Brian Armbrust, o=Ho Chung Builders,
ou=Project Manager,
email=armbrustbrian@yahoo.com, c=US
Date: 2012.06.27 18:21:08 -0500

(Contractor)

(Client)



Change Order Items

1. Add quantities for work to complete Elkhorn Crossing Recreation Area work:

ADD 2 picnic table concrete pads at \$575 each	\$1,150.00
ADD 30 ft of sidewalk and place ballast at lump sum \$525	\$525.00
ADD 60 tons of rock riprap on side slopes of boat ramp at \$36.75/ton	\$2,205.00
ADD Place fence ballards and 50 ft of new cable at lump sum \$425	\$425.00

2. Add quantities for work to complete Elkhorn Crossing Recreation Area work:

ADD 13,692 CY of earth fill (includes haul, place and compaction testing) at \$10.30/CY	\$141,027.60
ADD 1,277 tons of rock riprap at \$36.75/ton	\$46,929.75
ADD 629 tons of aggregate filter at \$26.00/ton	\$16,354.00
ADD 0.4 acres of pasture seed mix at \$1,700.00/acres	<u>\$680.00</u>

Net Change Order - ADD: \$209,296.35

HO CHUNK BUILDERS

1505 STABLE DRIVE

SOUTH SIOUX CITY NE 68776

PROPOSAL

FOR: ELKHORN RIVER IPA BANK STABILIZATION FIELD SITE 8

REFERENCE #: CHANGE ORDER 3 - FS8

<u>DESCRIPTION</u>	<u>UNITS</u>	<u>COST/UNIT</u>	<u>TOTAL</u>
1. Acquire, haul, and place earthfill as per specifications listed	13692	\$10.30	\$ 141,027.60
2. Acquire, haul, and place type B rock rip rap on bank	1277	\$36.75	\$ 46,929.75
3. Acquire, haul, and place aggregate filter as/plan detail	629	\$26.00	\$ 16,354.00
4. Pasture seed mix as per specifications	0.4	\$1,700.00	\$ 680.00

TOTAL ESTIMATE

\$ 204,991.35

HO CHUNK BUILDERS

1505 STABLE DRIVE
SOUTH SIOUX CITY NE 68776

PROPOSAL

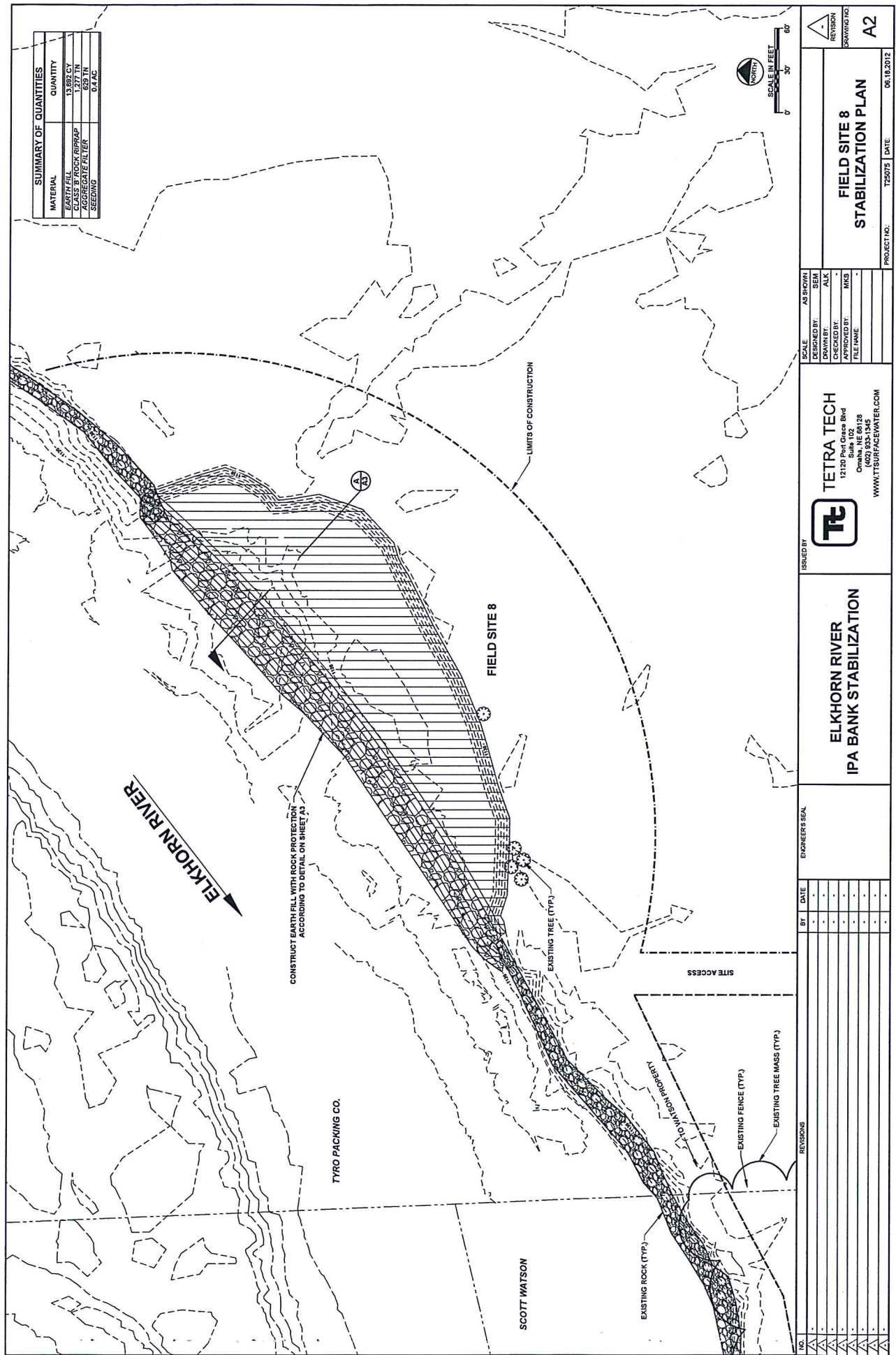
FOR: ELKHORN RIVER IPA REC AREA
REFERENCE #: CHANGE ORDER - REC AREA

DESCRIPTION



	<u>UNITS</u>	<u>COST/UNIT</u>	<u>TOTAL</u>
1. 2 concrete pads for picnic tables west of boat ramp 10' x 12' x .5'	2	\$575.00	\$ 1,150.00
2. Continue sidewalk to boatramp and place ballast at end, 5' x 30'	1	\$525.00	\$ 525.00
3. Extend rock on bank to top of slopes at boat ramp. price Per ton	60	\$36.75	\$ 2,205.00
4. Place ballards and new cable, approx. 50' cable	1	\$425.00	\$ 425.00

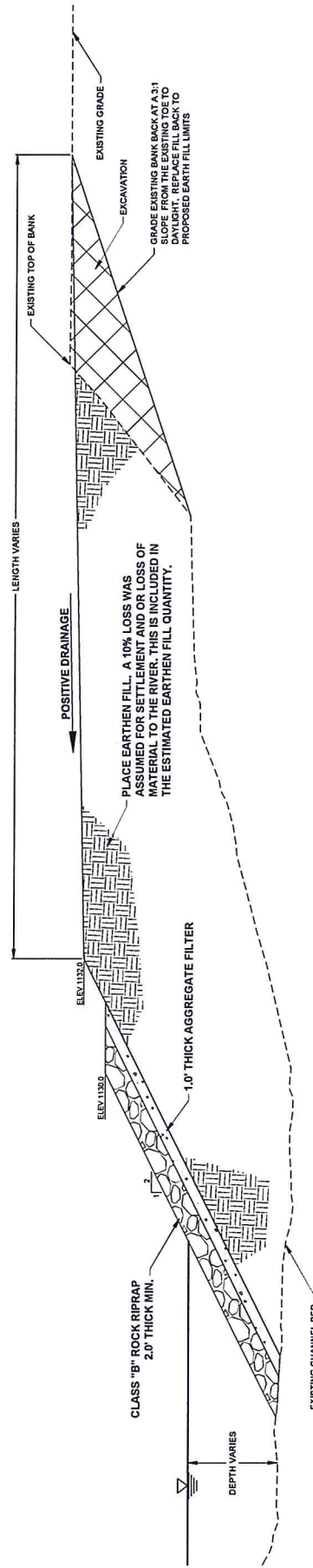
TOTAL ESTIMATE

\$ 4,305.00



SUMMARY OF QUANTITIES	
MATERIAL	QUANTITY
EARTH FILL	13,692 CY
CLASS II ROCK RIPRAP	1,277 TN
GEOTEXTILE FILTER	629 TN
SEEDING	8,740

		SCALE IN FEET 0 30 60	
DESIGNED BY: SEM DRAWN BY: ALK CHECKED BY: MMS APPROVED BY: MMS FILE NAME:		FIELD SITE 8 STABILIZATION PLAN	
ISSUED BY:		PROJECT NO.: T25075 DATE: 06-18-2012	
		TETRA TECH 12120 Pnd Chase Blvd Suite 102 Omaha, NE 68128 (402) 932-1345 WWW.TETRA-TECH.COM	
ELKHORN RIVER IPA BANK STABILIZATION		A2	



EARTH FILL WITH ROCK PROTECTION DETAIL (A3)
SCALE: 1/8"

REVISIONS		ENGINEER'S SEAL		ISSUED BY		TETRA TECH		PROJECT NO.		DATE		DRAWING NO.	
NO.	BY	DATE	BY	DATE	SCALE	AS SHOWN	DESIGNED BY	SECM	PROJECT NO.	DATE	DATE	DRAWING NO.	DRAWING NO.
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downstream from Field Site 5 appear to be in good condition, but Field Site 5 is unstable and eroding, with significant gaps in the existing rock/concrete rubble protection. The overbank area along this site consists of moderately thick woods. If continued lateral erosion into the wooded area is considered to be a problem, it may be possible to check the erosion with additional windrow revetment, applied at a rate of 2.5 to 3.0 tons/foot. Before such additional rock is installed, however, it would probably be prudent to study this area in more detail, including evaluation of the construction notes, to gain a better understanding of why the indicated bank erosion has occurred to insure that the recommended fix is, in fact, appropriate.

Field Site 6

Field Site 6 is an approximately 1,400-foot long reach of eroding right bank where cable-tree revetment was installed as part of the original IPA project (Site 13C) (**Figures 28a and 28b**). The bankline along this site is quite unstable, including significant areas of undercut, slumping banks (**Figures 29 through 31**), and it migrated laterally by over 110 feet in some locations between construction of the original project and the September 2009 aerial photograph. The June 2010 aerial photograph indicates additional lateral erosion at this site of up to 20 feet in some locations. The overbank area at this site is sparsely to moderately vegetated with large trees. If continued lateral erosion into this area is problematic, the erosion can be checked with windrow revetment applied at a rate of 3.0 tons/foot.

Field Site 7

Field Site 7 is a riprap point at the downstream end of the levee that was constructed in the late 1990s where the rock has been stripped off the underlying filter fabric (**Figures 32a, 32b and 33**). Although the erosion hazard does not appear to be severe at this location, the site can be repaired by replacing the rock with riprap of an appropriate size. It is recommended that a granular filter be placed under the rock rather than the filter fabric that was previously used to limit the likelihood that the rock will simply slide off the underlying filter.

It is interesting to note that the left bank opposite Field Site 7 has migrated to the south by over 150 feet in some locations and the right bank adjacent to the levee and buried windrow at the upstream end of Site 13C has accreted by a similar amount.

Field Site 8

Field Site 8 is an approximately 300-foot long scallop that has developed in the left bank just downstream from a pre-existing rock spur located at the downstream end of the windrow revetment for Site 13B (**Figures 34 and 35**). The bankline at this location retreated into the overbank by nearly 80 feet downstream from the rock spur. The IPA construction plans called for cabled-tree revetment for approximately 1,000 feet downstream from the rock spur. The cabled-trees were not installed during the original construction, but windrow revetment was placed in this area in the late 1990s (**Figure 36**; Table 1, Note 16). With the exception of the scalloped area, the remainder of the bankline appears to be relatively stable at the present time.

Recommended repairs at Field Site 8 include realigning the bankline to eliminate the scallop, and placement of appropriately sized rock riprap on the realigned bankline (**Figure 37**). The length of the realigned bankline would be about 350 feet, and the area that would need to be filled between the existing and new bankline is about 17,000 ft². Assuming a bank height of 12

feet, based on the topography in the IPA plans, plus approximately 5 feet of local scour on the outside of the bend, a total fill volume of about 7,600 yd³ would be required.

The upstream portion of Site 13B, where piled windrow revetment was installed at a rate of 3.0 tons/foot, appears to be relatively stable and functioning as intended. Most of the windrow rock has been launched, with 10 to 15 percent of the rock still in-place at the top of the bank along much of the site (**Figures 38 and 39**).

Field Site 9

The IPA construction plans for Site 13B called for the piled windrow revetment to end about 300 feet downstream from the edge of the existing wooded area, with about 540 feet of cabled-tree revetment extending upstream from the end of the windrow (**Figure 40**). The cabled-trees were not installed; however, windrow revetment was placed in this part of the site at some point either during or after construction of the IPA (**Figure 41**). This portion of the site is also in good condition and is functioning as intended. A modest amount of bank erosion is now occurring in the approximately 300-foot reach just upstream from the existing rock (**Figures 41 and 42**). Woody debris is currently providing some protection for the site, but continued erosion is possible. A large woody debris jam has formed along the right bank just upstream from the site that appears to be constricting high flows against the left bank at Field Site 9 (**Figures 43 and 44**). A similar, but somewhat smaller, debris jam, was present about 400 feet downstream from the current location as late as 2004 that may have contributed to the erosion tendencies at the upstream end of IPA Site 13B (**Figure 45**). The bankline at Field Site 9 has migrated laterally into the wooded area by up to 50 feet in some places since October 2004.

While Field Site 9 is not in a critically unstable condition at the moment, it should be monitored after future high flows, and the windrow revetment extended upstream at an application rate of 3.0 tons/foot, if necessary. Although the debris jam likely provides habitat value, removal of at least the part that projects into the main current would also relieve some of the erosional pressure on the left bank.

Field Site 10

IPA Site 13A consisted of approximately 3,000 feet of buried windrow revetment, with an additional ~500 feet of piled windrow revetment at the downstream end (**Figure 46**). An application rate for the rock of 3.5 tons/foot was specified for the entire site. A portion of the upstream end of the site tied into the Elkhorn Crossing Recreation Area. A berm was constructed in the early-1990s along the portion of the site shown in yellow in Figure 1 to prevent overbank flows from cutting across the meander bend (Table 1). Most of the site downstream from the recreation area appears to be in good condition, with the bulk of the windrow rock launched along the toe and mid-height portion of the banks (**Figure 47**). With the exception of an approximately 400-foot long area near the downstream end of IPA Site 13A, where the bankline appears to have migrated by up to 25 feet, the bankline along the entire site downstream from the Recreation Area has remained in about the same place since completion of the IPA (**Figure 48**). There are, however, gaps in the launched rock at several locations over an approximately 1,000-foot reach immediately downstream from the Recreation Area (Field Site 10, **Figures 49 and 50**). These gaps can be repaired by placing appropriately-sized rock along the toe and intermediate-height portion of the banks. Where appropriate, additional piled windrow rock can be placed along the top of the banks at a rate of 2 to 2.5 tons/foot to prevent further damage if the upper part of the bank continues to erode.

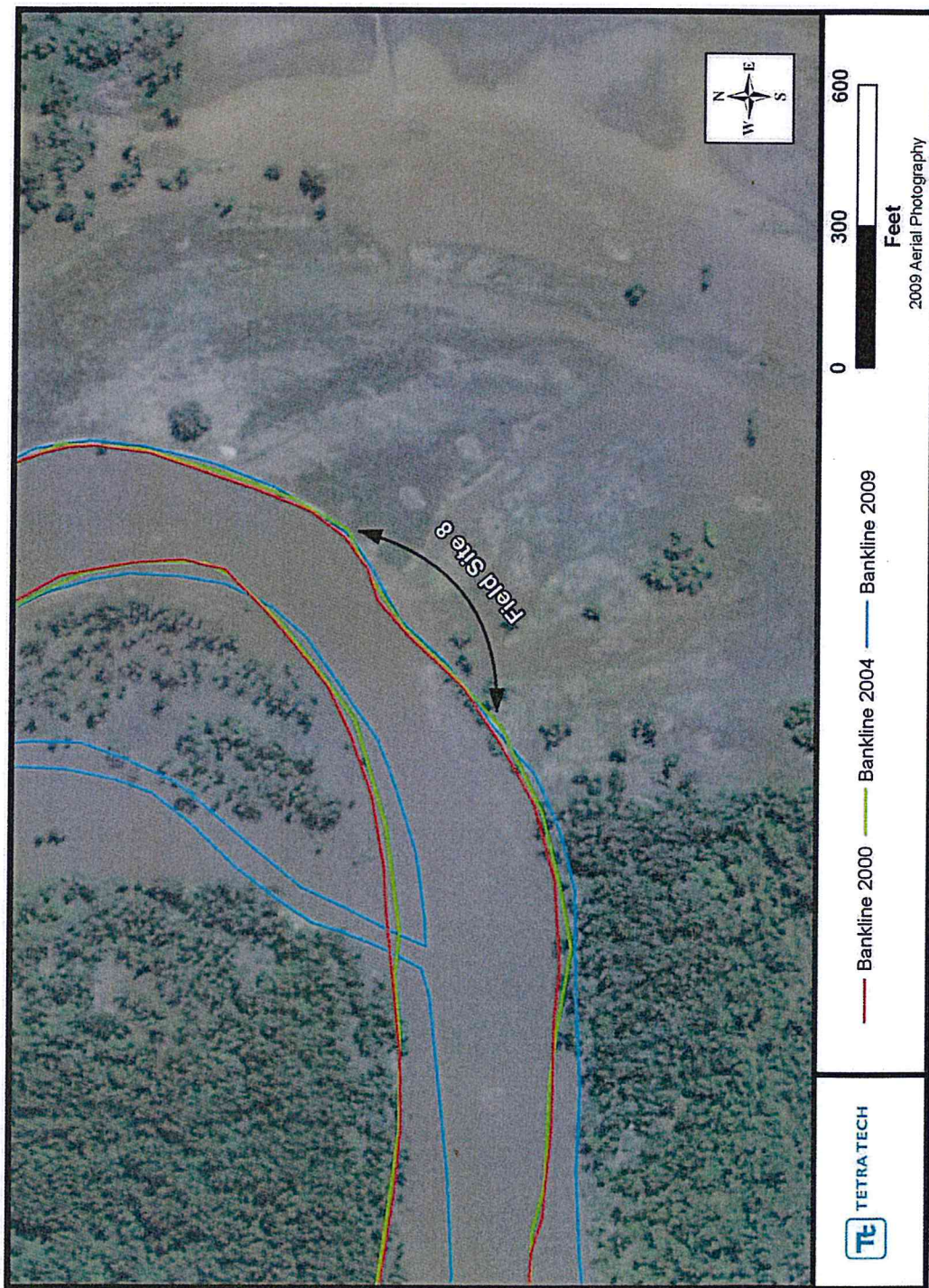


Figure 34. Aerial photograph taken on June 16, 2010 (discharge ~37,250 cfs) of Field Site 8. Also shown are the banklines from the October 2000, October 2004 and September 2009 aerial photographs.



Figure 35. View looking downstream flows from the pre-existing rock spur at Field Site 8 across the scallop in the left bank that developed during the June 2010 high flow.



Figure 36. View looking upstream along the bankline in the downstream portion of IPA Site 13B where cabled-tree revetment was called for in the construction plans. Note the launching rock along the bank. A portion of Field Site 8 is visible on the far left side of the photo.

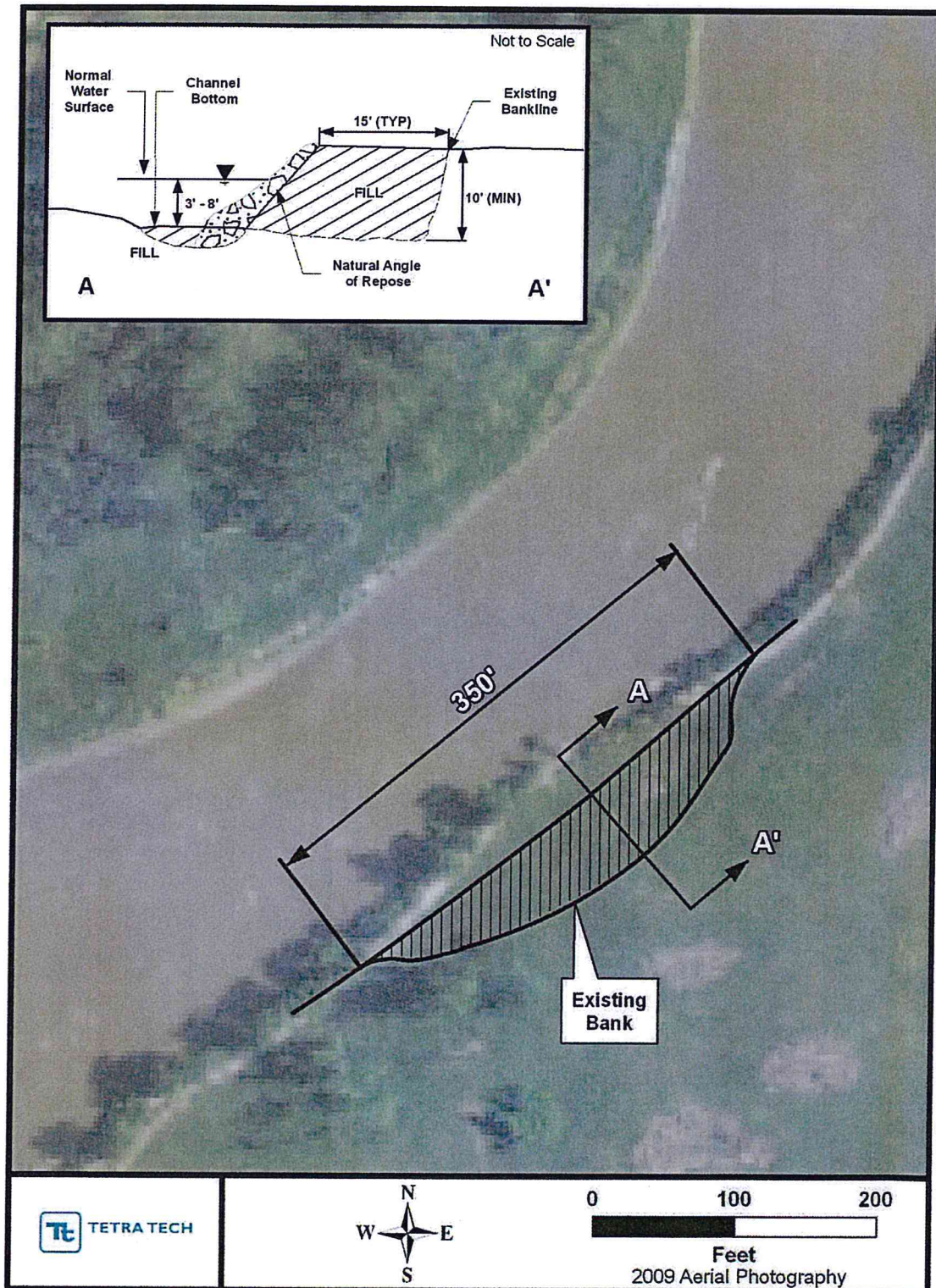


Figure 37. Recommended re-alignment of bankline at Field Site 8 and typical cross section of the rock riprap that should be placed along the realigned bank.